TRUTHS FOR THE TIMES AND THE PEOPLE.—No. III.

THE PHILOSOPHY

OF

EPIDEMIC CHOLERA;

BEING

AN ATTEMPT TO UNRAVEL ITS MYSTERY; TO DISARM ITS TERRORS;
TO ACCOUNT FOR ITS PHENOMENA
BY THE ORDINARY LAWS OF MORBID ACTION;
TO DEVELOPE THE TRUE PATHOLOGICAL CONDITION OF THE BODY IN ITS VARIOUS STAGES;
TO DEMONSTRATE THE INUTILITY OF HOSPITALS & QUARANTINES;
TO ENFORCE THE SYSTEM OF DOMICILIARY VISITING;
AND TO UNFOLD A MODE OF TREATMENT AT ONCE SAFE, SCIENTIFIC, AND SUCCESSFUL—A REMEDY WITHIN REACH OF EVERY HOUSEKEEPER, AND APPLIED WITHOUT COST, RISK, OR DELAY.

By JOHN BALBIRNIE, M.A., M.D.,
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AUTHOR OF "THE PHILOSOPHY OF THE WATER CURE," "THE WORDS OF A WATER DOCTOR," "THE PATHOLOGY OF THE UTERUS AND ITS APPENDAGES," ETC.

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PREFACE.

THE following pages were hastily put together for the press, two months ago, when the Epidemic was at its height. They should have immediately appeared thereon, but for the loss of the M.S. while in the hands of the printer. Other pressing avocations *then* did not permit time for re-writing it. Its appearance *now*, it is hoped, will not be too late. The public, having by this time recovered from the *panic* inspired by the disease, will be better prepared *to look it in the face*—(to use a figure of speech)—calmly to investigate the character of its phenomena, and to weigh the merits of contending modes of treatment; so as to be fore-warned and fore-armed against future visitations. *These are sure to happen* on the recurrence of similar favoring conditions of the malady, viz.: combined heat and moisture in the atmosphere, and the wholesale violation of sanitory laws occurring in the purlieus of Filth, Destitution, and Dissipation, in our great towns. Intramural sepulture has much to answer for in producing the disease in those whose position and precautions otherwise would ensure them immunity. Witness the case of the late Mr. ASTON KEY, a bright star in the professional constellation, prematurely quenched.

"Ergo —— perpetuus sopor
Urget? Cui Pudor, et Justitiæ soror
Incorrupta Fides, nudaque Veritas,
Quando ullam invenient parem?
Multis ille bonis flebilis occidit;
Nulli flebilior, quàm *mihi* ——."

This practice of burying the dead in the midst of the haunts and houses of the living, cannot be too severely reprobated. Legislative enactment must be called on to sweep it away as an intolerable nuisance, and as a disgrace to the Humanity and Science of the nineteenth century.

The writer, in conclusion, begs to ask, whether any of the rich and

philanthropie—so commendably liberal in giving prizes for essays on subjeets germain to man's best interests—have yet offered a £200 prize for the best essay on the Epidemie? Surely the present ocea-sion justifies something of the kind! He throws out this hint for the benefit of those able and inclined to aet on it, and gives it with the better graee that, as the author of the suggestion, he exeludes himself from the competition. But he hopes that some abler pen than his, disposed to take up the subjeet, may obtain from this humble traet the *germs* of sound Pathology, and of sueeessful Praetiee,—to be tested by future experienee, and developed by further researeh. This assertion, at least, he freely hazards, that, AS IN AN ENLIGHTENED PHYSIOLOGY ALONE, WE ARE TO LOOK FOR AN EXPLANATION OF THE PHENOMENA OF DISEASE GENERALLY, AND OF CHOLERA PARTICULARLY; SO NO TREATMENT THAT IS NOT BASED ON THAT SCIENCE, AND IN EXACT CONFORMITY WITH ITS DICTATES, CAN BE EITHER SAFE OR SUCCESSFUL. How drug-medieation, as preseribed by Allopathists, can be reeoneiled with this indisputable prineiple, we are totally at a loss to divine! Whatever may be said of the "Water-Doetor's" *theory*, his PRACTICE at least will be admitted to be pre-eminently physiologie.

J. B.

Coburgh House, Great Malvern,
Nov. 1, 1849.

EPIDEMIC CHOLERA,

ETC., ETC.

As regards the GREAT FIRST CAUSE of CHOLERA, as of all other good, or *apparent* ill, to mortals, it resolves itself simply into the FIAT of the ALMIGHTY, expressed and operating through the constituted laws of the system of things he has created.

To account for the *morbid phenomena* of Cholera, the interposition of a mysterious agency is not needed. There is nothing peculiar, nothing specific, nothing *sui generis*, nothing in itself incurable, in its symptoms. In this view, the terrors of the visitation as a supernatural disease are groundless, and should not be encouraged. It will be demonstrated, in its place, that THERE IS NO SYMPTOM IN IT, BUT WHAT IS COMMON TO OTHER DISEASES. Let this fact be deeply graven on the mind.

It becomes, then, an important question to solve, "To what has been owing the cruel fatality of Cholera?" To these causes incontestably. 1st. The insidious painless nature of its first stage. 2nd. The blind empiricism that has usurped the place of science, and dictated the measures of treatment. 3rd. The wonderment, alarm and confusion that its progress creates, have obscured the senses, or perverted the

judgment, of physicians,—disabling them from calmly surveying its course, or clearly reasoning on its phenomena. The best minds in the profession, indeed, have applied themselves to investigate the subject; but the discrepant views of its pathology, and the diversified and opposite modes of treatment contended for, introduce no less confusion into the Theory, than uncertainty into the Practice.

The ill-success of the treatment of Cholera, therefore, is no legitimate proof of its *essentially* malignant or incurable nature. It only proves that the proper time for effective action was allowed to pass; or that the disease was assailed with the wrong weapons. It will be plainly proved that the measures were faulty—the malady misunderstood. CHOLERA IS FORMIDABLE ONLY THROUGH NEGLECT, AND DEADLY BY MISJUDGMENT.

Cholera, when scientifically treated, is as easy of cure as most other diseases.

Cholera is a misnomer. This epithet is associated with the vomiting and purging of *morbid bile*. A name to designate it as a form of *hypercatharsis*, or excessive purging, *or a simple emptying of the blood vessels*, would be more appropriate. For in the depleting effect upon the sanguineous system, and in the morbid phenomena thereby induced, Cholera entirely resembles the profuse draining from drastic purgatives, as elaterium, castor oil, or tartar emetic in excess—or that from hœmorrhage, as by intestinal exhalation, or arterial rupture. The SEROUS DIARRHŒA, OR, THE SEROUS HŒMORRHAGE, if some like to call it so—*the insidious drain of vitality*—IS THE FUNDAMENTAL PHENOMENON OF THE DISEASE. This is not even *now* well understood—at least sufficient stress is not laid upon its bearings.

A wrong *name* of disease is mischievous, because it leads to wrong views, and wrong practice. At the very off-go, in this malady, the profession was set *off* the true scent in the path of inquiry, by confiding in a

name which made its true *nature* to be misapprehended. The fatal consequences of this error have been perpetuated by the habit of medical men, like others, too blindly following the opinions and practice of their leaders, without thinking for themselves.

DISEASE,—*i. e.*, the deviation of the corporeal functions from the ordinary rythm and regularity of health—is legion in *name;* but in *nature*, in essence, in its ultimate organic conditions, or material elements, it is simple, almost unique. Its predisposing and exciting causes,—that which produces the corporeal disturbance, that which alters the conditions of normal (standard) action,—are in most cases equally plain and palpable.

In the SYMPTOMS of disease, it is a great point to distinguish what are *abnormal, disorganizing processes*, from those which are *natural, self-protective efforts on the part of the economy.* The confounding of this distinction creates great confusion in medical writers, great fallacy in medical reasoning, and great mischief in medical practice.

CAUSES.

The normal vital functions depend on the simultaneous and combined action of certain external circumstances, called vital STIMULI; viz., *food, water, air, heat, temperature, moisture.*

These are the sources of corporeal power,—the conditions of vital movement in the animal machine. The functional play of organic structure,—every motion, great or little, of the living apparatus, disengages heat,

and dissipates it, and, therefore, by the first laws of chemistry, must disintegrate piecemeal that structure which is in every atom and molecule (especially of its soft parts) the scene of incessant *change*, reproduction, and decay, from its first development to its final decay. The means, therefore, of keeping up this constantly radiating or evaporating heat, and repairing the structural "wear and tear,"—in other words, of the maintenance of that equilibrium of the functions in which health consists,—depends upon the due supply and the due mutual relations, of all these allied agents constituting the *pubulum* and *stimuli* of vitality. *This is the grand secret of health,—the keeping up of the just proportions of these conditions.* When even *one* of these conditions is absent, the equilibrium of the whole is disturbed, and health is disturbed. Sometimes several or all of these conditions are absent,—as in the case of the ill-fed, ill-clothed, ill-housed, ill-washed, ill-conducted, and ill-minded classes. Any external noxious influence operates upon them just as the ratio of the absence of the conditions of health, and the disturbance of the balance of the functions thereby entailed. In proportion as the conditions of health obtain in any individual, as his corporeal equilibrium is maintained—to that extent is he able successfully to resist external noxious influences. Hence the well-taken-care-of classes, the well-fed, the well-clothed, the well-housed, the well-washed, the well-conducted, and the well-minded classes, are those who generally escape the ravages of endemic or epidemic diseases. The *efficient* cause of Cholera depends on the concurrence and combination of certain conditions in the atmosphere, and in the human body. The cause of Influenza, the cause of the potato-blight, the cause of Cholera, the cause, perhaps, of all wide-spread epidemics, is to be sought for in the temperature and hygrometric state of the atmosphere. The latter conditions are such as to disturb the normal state of the transpiration from the pulmonary and cutaneous surfaces. Liebig's researches have made it manifest, that one of the most

important of the many functions of the skin and lungs is to determine the motion of the fluids towards the exterior by the evaporation constantly taking place from these large exhalant surfaces. *The amount of the motion is directly proportional to the rapidity of the evaporation*, i. e., *to the temperature and hydrometric state of the atmosphere.* The evaporation, in fact, produces a virtual vacuum within the pores: by the external pressure, the fluids are forced into these pores. The suppression of transpiration by combined heat and moisture in the air, is followed, of course, by a check to these outward motions of the fluids. A primary condition of life is thus interfered with. Interior congestions, sanguineous accumulations in vital structure, especially in the mucous membranes, arise. This unequal distribution of the fluids persists, or is resisted, just in proportion to the previous impairment or soundness of the health. The LAW that induces the prevalent form of an epidemic is not yet ascertained. But this taken for granted, the health has only to be profoundly affected by sufficient causes, whether of long or brief operation, to induce an attack of the disease. Hence people in full health, exposed to the effluvia of a newly-opened grave or drain, will sometimes be so overpowered, and instantaneously, as to go home, sicken, and die. The miasmatic principle here enters the circulation through the lungs. This is a usual inlet of disease, especially in endemics. A morbid poison has been received, which lowers the vitality of the blood, disorganizes it, brings its simple *chemical* affinities into play at the expense of the *vital.* Hence in Cholera, the facile separation of the serum from the fibrine of the blood.

The PREDISPOSING AND EXCITING CAUSES OF CHOLERA stand out plain and patent to the understanding. Whatever fatigues, debilitates, or exhausts the body—as fear, grief, anxiety, despondency, privations, poverty, filth, intemperance, irregularities, excesses, alcoholic drinks, impure water, unsound food,

spoiled grain, unripe fruits, the flesh of animals decomposed or diseased, drastic purgatives, exhausting diseases, and *drains* of all sorts;—the vitiated air of close streets, alleys, courts, cellars, hospitals, barracks, camps, ships, etc;—the noxious emanations arising from wherever human beings are huddled together in filth and wretchedness, or those from putrescent substances;—effluvia, that disagreeably affect the mouth, throat, nose, and alimentary canal, inducing sickness, indigestion, colic or diarrhœa;—cold or hot air, being saturated with moisture, which presents an obstacle to perspiration, and thereby determines an excess of action in the intestinal mucous membrane;—the surface being in perspiration, and suddenly checked by *long* exposure to cold, which produces the same counter-balancing effort of the interior;—in short, whatever lowers the corporeal powers, or depresses the mental energies, acts in the same direction, on the same organs, as the epidemic influence. In all the foregoing category of cases, the healthy equilibrium of the organism is disturbed—the organic nervous centres especially are enfeebled, and simultaneously the blood-circulating, blood-making, and blood-purifying functions are impaired. In the train of the diminished nervous, circulatory, and nutritive functions, follows diminished resistance to deleterious or undigested particles of food, and to the disorganizing tendency produced by the diminished quantum of a vital principle in the atmosphere, (electricity,) or by a positive morbid poison inhaled (in noxious gases.) Under these favouring conditions of Cholera, rank, age, or sex, admits no exemption, claims no privilege. The cause and intensity of the disease, however, are modified by peculiarities of constitution, habits of life, mode of treatment, etc. The disease, at one time, for example, sets in suddenly and violently—running its impetuous course in a few hours. At another time, the symptoms ensue more slowly and moderately—the disease being kept in check for days.

SYMPTOMS OF CHOLERA.

It will tend to a clearer development of the COURSE, CHARACTERS, and GRADES of the malady, to consider it in the FOUR STAGES into which it naturally divides itself.

FIRST STAGE—commonly called *the premonitory stage.* The phenomena which mark the onset of the disease remain more or less its leading characteristics throughout. They are as follows. White, furred, slimy tongue; want of appetite, or food remaining long on the stomach; weight, oppression, faintness, or a sinking, empty feeling at the stomach pit; numbness, giddiness, lightness of the head; debility, distress, anxiety, tremors; sharp features, shrunk skin; rumbling in the bowels; diarrhœa, milder or severer—at first the natural contents of the bowels, then milky matters (unabsorbed chyle), till it becomes transparent—often attended with pain, oftener without. The pulse is natural, or only slightly accelerated; the surface is dry; the urine scanty, and voided with difficulty; cold clammy feet; small alvine dejections, but withal a feeling as if the whole bowels were being expelled. *There is an entire absence of biliary matter in the secretions:* to this there are but rare exceptions. In the majority of cases more or fewer of these symptoms prevail for several days. According to their measure and rapidity, the languor, debility, emaciation, mental and bodily prostration of the patient increase and usher in.

The SECOND OR ALGIDE STAGE. The bowels now become affected at intervals of a few minutes. The dejections are clear, transparent, like whey or rice water, accompanied with sickness and vomiting of the same sort of matters. Thirst increases apace,

but the water drunk is immediately rejected. The fluids recede from the surface and accumulate in the interior. With the rapid draining away of the serum through the mucous membrane, the pulse and the temperature sink *pari passu*, till at length the coldness of death comes over the body. Cramps set in. The voice becomes hoarse and squeaking; the breathing laborious. Pain and constriction are felt in the region of the heart. Restlessness, tossing, and anxiety increase. The disease now assumes its most aggravated phase, and the organic conflict is at its height. Whether victory will declare *for* or *against* the constitutional powers, is determined by their previous integrity or impairment, as well as by the measures of treatment. The cramps, spasms, and convulsive tremor of the muscles of different parts of the body, especially of the limbs, harass the patient exceedingly; in the intervals of their cessation, and that of the vomiting, he doses off. The brain partakes of the profound depression of the organism. The patient is dizzy, and deaf, and regardless of what takes place around him; even the former anxiety for life yields to complete indifference; but his faculties when roused are found intact; the intellect, indeed, is sometimes singularly clear to the last moment of life. The urine is entirely suppressed; there is great commotion of the bowels, with or without griping; and vomiting and purging of clear flocculent saline matters. These exhale a characteristic odour, sometimes urinous, occasionally fœculent, the dejections are often spurted forth in a continuous stream, as from a pump, at times they present the appearance of beef-washings, from the admixture of blood-globules. The thirst is now intense—the patient's chief cry being "water." The difficulty of breathing, and the feebleness of the pulse go on increasing. The surface is as cold as marble, and has the clammy feeling of a frog's belly. Profuse viscid perspirations set in; the hands are shrivelled like a washerwoman's, the countenance is skinny and cadaverous;—the eyes sunk, turned up, and half open. The skin is of a purple, livid, or dusky brown hue. The voice becomes feebler, hoarser, and more sepulchral. Notwithstanding

the human fabric is thus shaken to its foundation, and tottering to its fall, yet the muscular energy is not altogether departed. The patient can rise or sit up, but in attempting to walk, he generally swoons away. The patient tosses to and fro—in vain seeking relief by change of place. The ice-cold surface gets colder, if possible. The pulse ceases to beat, even in the great arteries. The movements and sounds of the heart become imperceptible. Profound coma closes the scene.

In the majority of cases, however, and before things have come to the last pass, Nature makes a grand stand against this rapid organic overthrow. The tumult subsides through sheer inability of the system any longer to furnish wherewithal for its continuance. This constitutes

The Third Stage—that of collapse. This phase of the malady is characterized by profuse passive exudation from the skin; icy coldness; imperceptible pulse; intense thirst; burning heat of the stomach; respiration slow and laborious, often convulsively roused by the spasms. The tongue is moist, cold, and pale, the breath cold. There is entire muscular prostration; with unusual cessation of the alvine discharges. But passive vomiting and involuntary stools often continue to the last. The urine is still suspended. The mental functions continue correct but dull. The eyes are suffused. The skin is inelastic, and morbidly sensitive—external applications being annoying. *The organism is now dead-beat.* All the functions are at a stand. The patient oscillates between life and death; and a feather's weight would seem sufficient to turn the scale against him.

In this dread extremity of Nature, she happily often rallies and triumphs. This introduces the

Fourth and last stage—that of reaction. The evacuations decrease, or cease entirely. Warmth is gradually restored. The complexion recovers. The

eyes brighten. The skin fills up apace. The breathing becomes freer. The pulse rises. The tongue gets moist. The passive viscid oozing from the skin now turns into a copious and kindly perspiration. Calm is speedily re-established, and a genial sleep recruits the battered organism. In a few days convalescence is perfect.

But matters do not always go on so prosperously. Instead of this favourable termination, the patient often verges into an equally critical state with that he has just escaped from. The progress from the grave to health is too rapid to be good. The patient just escaped the Scylla of *exhaustion* is caught in the Charybdis of *consecutive fever*. The case is no longer one of Cholera. *That* demon is at least *laid*. But the very violence of the means taken to quell him, has introduced another equally difficult to exorcise. In plain words, *the organism has been over-stimulated*. The *coup de grace* is given to the struggling vital powers by the sanguinary depleting measures used by the orthodox, in many cases, to allay the factitious excitement that supervenes on the patient rallying.

This morbid excitation of the system which usually follows the patient's exodus out of Cholera, *as usually treated*, is chiefly due to the excessive drug, or alcoholic, stimulation of the preceding stages. What between the stimulation and depletion in the first and last period of the malady, the chances of ultimate recovery for thousands (who would else recover) are destroyed; or the constitution is left belaboured and broken for life. If no unnatural stimulation has been used in the early stages of the malady, the reactionary excitement is moderate. The functions gradually recover the tone and rythm of health. But if otherwise treated, we have evoked the low Typhoid fever into which patients are apt to fall after exhausting drains of any kind. In this condition, the previous *violet* of the face is exchanged for *red*. The white fur of the tongue becomes brown. Sordes (black crusts) collect about the teeth.

the lips, and the tongue. The latter is red, dry, rough, and tremulous when protruded. The thirst continues. The heat increases. There is an indisposition to motion and mental exertion. The urine is suspended, or high-coloured, scanty, and mostly retained by reason of the stupor. The pulse is rapid, small, and hard. The respiration is accompanied with sighs and moans. The eyes are suffused and drowsy; the pupils contracted. The countenance is dull, heavy, stupid. There is forgetfulness, delirium, agitation. Sometimes light spasmodic movements of the limbs and jaws occur. In short, *distinct low Typhoid fever is present.* The patient often perishes, as is usual in that disease, by symptoms indicating serious implication of the organs of the Head, Chest, or Abdomen. Where convalescence takes place, it is usually tedious. The digestive functions especially are long of recovering themselves.

Prognosis.—Favourable and unfavourable signs in Cholera. The danger in the first stage of the disease is very slight; unless the remedies be mal-apropos, mal-administered, or too long delayed. The danger is in proportion to the extent and rapidity of the intestinal discharges, modified by the constitution, age, habits, etc. of the patient.

Diarrhœa of several days' duration is more dangerous than when only of a few hours' standing.

The likelihood of the patient to recover is much greater when he is anxious to recover, than when he is indifferent to his fate.

When active vomiting sets in early, the danger is lessened. When free warm perspiration follows vomiting, and bile is found in the dejections, the patient may be considered safe.

Absence of spasms in the collapse is characteristic of the most dangerous form of the disease. The patient in this case sinks more rapidly than when they are present.

In collapse, *cæteris paribus*, the cases that have come on suddenly are more likely to recover, than those that have been of slow progress.

Profuse perspiration, shrivelled hands, marble coldness, and creeping pulse, shew great danger. If the perspirations and shrivelling abate, notwithstanding the cold skin and imperceptible pulse, there is hope.

The breathing continuing frequent and full, even convulsive,—and the senses remaining clear—are good omens.

While the power of breathing and swallowing remains, never despair of a case.

In the consecutive fever, the danger is from the *local* complications.

SOURCE OF THE DANGER IN CHOLERA.

In developing accurate views of the nature and seat of disease, the great point is to seize, if possible, the first link in the chain of morbid causation—to ascertain the starting-point of the characteristic phenomena—thence to open up the *fons malorum* and to deduce the sources of danger.

The precise seat and nature of a disorder are only to be satisfactorily determined in its *onset*, and not after it has advanced to a fatal termination. *Then* generally its complications are insolvable ; at least, it is impossible to affirm what is *cause* and what *effect* of the disease —what are *primary lesions*, and what *consecutive results*. This is pre-eminently the case with Cholera. It is vain to expect that its nature will ever be learned from

dissections. Overhauling the ruins of a conflagration may as well be expected to reveal its origin, or to tell the story of its progress. In Cholera, no grave organic lesions are found adequate to account for the fearful nature of the symptoms. What presents are rather the EFFECTS of the disease than its CAUSES. This is very manifest. The structural alterations observed are influenced by the periods of the malady. No organ is uniformly congested or inflamed. There is softness, paleness, shrivelling, and friability of the tissues; with venous engorgement, and what is falsely supposed and called *arterial injection, but which is mere simple extravasation,* in patches here and there—especially in the alimentary canal. There is rarely further disorganization. *Inflammatory action, we boldly assert, is impossible in Cholera.* The profuse drains would reduce such a state at once—at least what is understood in the schools by inflammation. The internal heat is merely morbid sensation.

The epidemic Cholera is usually assumed as an aggravated form of common *Cholera Morbus.* But it has nothing in common with it. It a perfectly distinct disease. The latter is, from the onset, a vomiting and purging of bilious matters—is a disease essentially of warm weather, and warm climates. There is an augmentation of the *quantity* of the bile, and an alteration of its *quality*—doubtless from changes produced in the mass of the circulating fluids, or in the function of the liver itself. The natural properties of the bile are cathartic. If it becomes morbid and acrid, it produces vomiting and purging—if less acrid, bilious diarrhœa simply—if vomiting is superadded, the disease is then named Cholera.

"What is diarrhœa pathologically? What is the peculiar characteristic of the diarrhœa of Cholera? Wherein consists its danger?" The answer to these queries will reveal the nature of Cholera, solve its enigma, dissipate its terrors, and suggest the true treatment. To this task we now apply ourselves.

The intestinal membrane, with one exception, is the most elaborate, complex, and delicate structure of the animal economy. It is composed of innumerable glandular bodies, capillary arteries, veins, absorbents, exhalants, nerves—all embedded in areolar (cellular) tissue.

The membranous structure of the skin, lungs and bowels is analogous. This assertion might embrace the kidneys, if we restrict it to the inner lining, wherein the active part of their functions is performed. These four exhalant surfaces are substitutionary, convertible, or vicarious in office—the diminution of one being replaced by the extra-activity of another. Thus their balance is preserved. When the drains from any of these are profuse, rapid emaciation and grave disease are the consequences.

It is a law of the action of Epidemics that their influence on the human tissues is *elective*. They debilitate certain organs in preference to others, giving a proneness to take on morbid action, so that slight causes will determine violent disease in that structure. In Influenza, for example, this epidemic predisposition is thrown upon the mucous membrane of the air-passages. Any cause that disturbs the equilibrium of health, as dietetic errors—exposure to cold, (*i. e.*, chill of surface) —excitement of mind from the worry of care, the turmoil of business, or the tumult of passion, will develope the disease. *Without* such predisposition, these exciting causes would be powerless.

It is a well known pathological principle, that all substances which act as irritants of the intestinal canal —as acrid bile, undigested aliments, vitiated water, irritant drugs, alcoholic drinks, etc.,—provoke an excessive activity of the intestinal exhalants and mucous glands. The object of these secretory efforts is to wash out the offending contents of the bowels, and to sheath their delicate coats. Hence it comports with

fact, and science, and sense, that the ordinary contents of the bowels are first discharged in Cholera.

The nosological division of diarrhœa goes no further than to recognize the *sensible* properties of these contents, according as they are *bilious*, *mucous*, *serous*, *crapulous*, *lienteric*. This is a coarse arrangement, without practical utility. The final cause of diarrhœa is obvious. However induced, whatever its appearances, *it is in the first instance, an effort of self-protection on the part of the economy*. What it imports to determine, is beyond what point this natural self-protective effort becomes unnatural, undue, excessive, morbid? For as the object and intent of the effort is one and identical in all kinds of diarrhœa, so is the source of the danger one and common, when that effort exceeds the healthy limit. This healthy limit is evidently the point *at which serous discharges begin to manifest themselves*—shewing thereby excessive action of the intestinal exhalants and glands; and subsidiary to this *excessive contractile activity* of the intestines, to expel the fluids thus profusely poured into them. *Up to this point* diarrhœa answers its ends—ridding the body of irritant or ungenial materials—expelling a dangerous intruder from the economy. When the glandular and exhalant action has passed this limit—*when it persists after offending matter in the bowels has been removed*—then it exceeds its end and object. From a salutary, moderate, physiological action, it becomes pernicious, immoderate—a pathological condition, if unchecked.

The rapid passing of this healthy limit, and the tendency of the exhalation to persist unchecked, is the peculiarity of the Diarrhœa of Epidemic Cholera. A morbid predisposition and action of the exhalant tissues exist, in virtue of which, the slight irritating qualities of tainted water, unwholesome food, or stimulating drugs or *drams*, an occasional irregularity or excess, an indigestible meal, exposure to cold, mild aperients, mental emotions, the inhalation of foul air, etc., at other times innocuous, now purge profusely.

In Cholera, moreover, the irritation of the neutral salts of the serum passed through the intestinal exhalants keeps up and aggravates the morbid action of the tissue—these discharges acting on the highly susceptible membrane as a purgative mixture!

There is a precise analogy between the symptoms of Epidemic Cholera, and those of fatal cases of Cholera-Morbus, Dysentry, Hypercatharsis, Hæmorrhage, Suspended Animation, Intermittent and Remittent Fevers, Typhus, Measles, etc., etc. In consumption even, the complication of Diarrhœa is a frequent cause of death. The hopeful cases are those where the bowels are constipated.

Unloading the blood-vessel system in any way, when effected to the same extent, produces everywhere the same symptoms;—viz., sinking, feeble pulse, fluttering heart, oppressed slow breathing, faintings, convulsions, cramps, spasms, vomiting, cold surface and extremities, internal congestions, clammy sweats, corrugation of hands, shrunk features, livor, etc.

The essence and characteristic of the Diarrhœa of Epidemic Cholera consists, then, in a morbid patency, a relaxed dilated state, of the exhalant mouths of the capillary vessels of the intestinal canal, whereby they freely admit the exit of the more fluid part of their contents—the serum of the blood—sometimes even the blood-discs (globules.) The chemical ingredients of the serum, its neutral salts, irritate these delicate patulous tubes. The consequence is (in conformity with the sound Hippocratic principle *ubi irritatio, ibi affluxus,*) a morbid afflux of the humours of the body is determined to the mucous surface of the intestines. *The excretory functions, in fact, of the skin, lungs, and kidneys are virtually taken on by the bowels!* The supply, therefore, of the copious serous evacuations in Cholera is not far to look for—especially when it is known that seven-eighths of the body are resolvable into fluid constituents.

From the foregoing observations, it is clearly manifest that the drain of the serum and salts of the blood, is the source of the danger in all diarrhœa—whether it proceed from cathartic drugs, irritant ingesta, or the epidemic influence. *The effect is tantamount to bleeding a patient profusely.* It is an equal drain of the vital fluids, and equally takes off from the blood-vessels the stimulus of distention. Accordingly we have failure of the circulating powers to the exact extent of the evacuations. This is the reason, plain and palpable, why the diarrhœa of Epidemic Cholera is so virulent and intractable compared with all other forms. *Its serous discharges are greater* beyond compare than those of any other kind. These exhausting drains are the *fons malorum* of Epidemic Cholera—the source of all its essential phenomena.

The principle that the sudden escape of the serous fluids of the body, produces the same effect as bleeding is well known, and constantly acted upon in the treatment of disease. When the object is to reduce inflammatory action, the neutral salts which produce copious watery stools, by irritating the exhalant mouths of the intestinal capillaries, and unloading the mucous glands, often induce all the profound depletion and depression of the system that bleeding would effect. It is therefore had recourse to as a substitute, or as subsidiary to bleeding. In cases of hepatic engorgement, in fulness or obstruction of the portal system, and in the dropsies thereon dependent, serous drains from the bowels are well known to operate a powerful reduction.

RATIONALE OF THE SYMPTOMS.

The condition of the Cholera patient in regard to the fluids of the body is this. In the beginning of the complaint, there is probably no essential change in the *amount*, although there is doubtless in the *composition*, of the blood. As the disease progresses, the relative proportions of the ingredients of the blood are changed. The serum and salts are greatly diminished, and the fibrine or clot is twice as much relatively as in health. This alteration of the proportions of the fluids is not a primary pathological lesion, *but the mere result of the intestinal discharges.* The difference of the composition of the blood in the early and later stages of the disease is intelligibly accounted for by the withdrawal of some of its elements. The serum has oozed out; what remains are the thicker constituents, of course, which mechanically obstruct the free flow, and render impossible the oxydation, of the blood. The change thus operated in the relative composition of the fluids of the body, explains, on the clearest principles of physiology and pathology, all the urgent and characteristic phenomena of Cholera. *From this fundamental pathological lesion all its symptoms flow in a regular chain or gradation of morbid sequences.*

The peculiar symptoms produced by the drain of the vital fluids of the body, when rightly considered, *are efforts of self-protection on the part of the economy.* Under exhausting diarrhœa or hæmorrhage, the blood retreats from the less important organs of the surface to the grand citadels of life in the centre. Fainting is an operation of Nature to this end. Vomiting and purging, as symptoms of intestinal irritation, are efforts to throw off a *materies morbi.* Vomiting, as the result of a *shock* to the nervous system, is an effort to rouse vital action. The same effort of Nature is used to

arrest internal sanguineous exhalations, by the powerful mechanical expression of the muscles and vessels it calls forth. In many cases too of obstructed liver, the violent succussion of the frame in the act of vomiting, and the mechanical compression of the portal system, is the only chance to rouse its suspended functions, or to open its closed outlets. The conservative tendency of the same action (vomiting) is evinced in Cholera—albeit it be thwarted by the serous nature of the discharge. In this case, by exciting powerfully the contractions of the diaphragm and abdominal muscles, vomiting brings the blood back to the heart, stimulates its movements, distends the lungs, and excites the respiratory function; at the same time it determines a brisk sanguineous flow to the surface and extremities—thus augmenting the animal heat and opening the pores. This intimate relation between vomiting and sweating is of great significance, and is a provision of the constitution often had recourse to, to counteract the tendency of intestinal irritations. It is the nature of these latter to produce morbid congestion and exhalation. Vomiting, by throwing the blood back again upon the surface, tends to restore the lost balance of the circulation. This is the *rationale* of the utility of early vomiting in suspending the intestinal exhalations in Cholera.

The transparent discharges upwards and downwards. The blood having partially lost its vitality comes under the dominion of the physical laws to that extent. The affinities between its constituents are weakened. The serum tends to separate from the fibrine,—the fluid from the solid portion. The flood gates of the bowels being once opened, the determination is all to that quarter. The profuser the discharge there, the more the irritation there, and the greater the afflux there. Hence the increasing intensity of the symptoms, and the little probability of arresting them by drug-irritants, or of their spontaneous cessation. Hence, when it comes to this pass, those who recover are cured by

some *coup de main* of Nature, and not by the efforts of drug-medication.

The unquenchable thirst needs no comment. It is evidently the call of Nature—an unmistakeable instinct—to replace the fluid ingredients of which the system is being so profusely drained.

The spasms and convulsions have nothing peculiar in them. They are the results of repletion or depletion of the vessels. They attend, in irritable subjects at least, corporeal drains, as from hæmorrhage, purgatives, etc. They are observed in the last struggles of animals that die from loss of blood, or in persons strangled. They are nature's efforts, doubtless, to rouse the quelled respiratory movements, to re-commence the arrested circulation, and, by the action of the muscles upon the veins embedded in them, to bring the tide of the vital current back to the heart.

The absence of bile, so characteristic of Cholera, is easily accounted for. The materials of bile are diverted to the intestinal mucous membrane; the powerful drain of fluids from which naturally cuts off the supply to the liver through the portal veins.

The same diversion of the aqueous fluids of the body equally explains *the suspension of the functions of the kidneys*, and the consequent shrivelling up of the bladder—symptoms which have excited much needless wonder, even among pathologists. For this, even *catheterism* has been gravely proposed, as if the bladder had been full, but paralyzed!

Collapse is a necessary sequel of the previous stages of the disease. It is the result of depletion, and is the index of the prostration, waste, and exhaustion of the organic energies. This state is the natural termination of all diseases and arises, 1st, from the disorganization of some vital organ, or 2nd, from debility from sudden or gradual lessening of the volume of the circulating

fluids. This also is an effort of self-protection, the last resource of the struggling organism to restore the lost balance of the functions. The discharge ceases from the failure of the circulation, as in the collapse of hæmorrhage. The blood vessels are unable to accommodate their calibres to their rapidly departing contents. Circulation therefore is at a stand, and fainting follows.

The gasping and convulsive breathing is from spasm of the respiratory muscles: this is a common symptom in asphyxia.

The dusky, livid hue of the patient; the bright scarlet of the blood depends on its aqueous and saline ingredients and on its due circulation in the lungs. These conditions are absent in the case in question. Due oxydation, *arterial* colour and properties of the blood, are therefore impossible.

The viscid clammy sweats are always the accompaniment of an intense state of constitutional weakness, or exhaustion of the organic energies.

Death in Cholera results from sheer depletion! THE ORGANISM IS ENTIRE. The circulating fluids only are required to keep up the vital functions. *Animation is suspended, but the vitality of the blood-vessels remains.* In course of time they accommodate themselves to their diminished contents, and contract on them. Hence many *apparently* dead, and even *laid out*, begin to shew signs of life, and ultimately recover. So, in many cases where the patient had ceased to breathe, the vessels have been supplied with aqueous and saline ingredients, and the arrested circulation has recommenced. In a few cases life has been thus restored, when all hope else had been abandoned.

The reaction of Cholera is as simple to explain as all the rest of the symptoms. Nothing else happens here than when the system rallies from sudden collapse, or from any other cause. It is a law of suspended func-

tions, that, when their activity recommences, it is followed by signs called reaction. This is not a diseased state. *It is an effort to counteract interior congestions.* The intensity of the reaction is in proportion to the measure and duration of these congestions. That the reaction in Cholera is often so great as to constitute of itself a diseased state, depends on the over-stimulation of the system by *drams* and drugs in the previous stages. Many who escape the perils of the disease perish of the treatment! What, therefore, is called *Cholera Typhus*, and classed by some as a stage of the disease, forms, in truth, no part of its phenomena. It is only an accidental sequel. For this Cholera-doctors have to thank themselves.

TREATMENT OF CHOLERA.

The success of curative measures is the greater in proportion as they are early had recourse to. *This disease, like most others, may be easily and perfectly controlled in its incipient stage.* Indeed, so certain are proper remedies in this stage, that no case should prove mortal if attacked in time. The efforts of Nature, with the simplest resources of art, will then suffice for the cure; with the occurrence of vomiting and spasms, comes the deadly tug of war; mastery of the foe is then difficult,—sometimes impossible, even under the best system of treatment.

The simple and unique *indication* in Cholera, and the only *safe, scientific, and successful* practice,—is to make a *metastasis* (transfer) of the departing fluids of the body,—to turn the tide of the exhalations from the interior to the exterior surfaces;—in other words, to check the drain from the intestines, by determining a drain from the skin. The principle implied in this aim is equally sound in physiology and pathology. This end accomplished, Nature will do the rest; but how is this paramount end

to be achieved. In the solution of this question is contained the philosophy of the cure of cholera.

To accomplish this *all-in-all* end, viz., the diversion of the fluids of the body from the bowels to the skin,—common sense dictates the use of the simplest, yet safest and most effective means. Hence we repudiate the whole host of drug-nostrums, alcoholic and other stimulants, mercurials, opiates, astringents, antacids, absorbents, emetics, cathartics, venous and saline injections, *et hoc genus omne.* THE TREATMENT BY THESE MEANS IS NO BETTER THAN BLIND EMPIRICISM. In such a malady especially, we contend that ALL MEDICINE IS HAZARDOUS, and therefore to be excluded the list of remedial means. We lay it down as an irrefragable proposition, that THE OPERATION OF ALL MATTERS NOT FITTED OR INTENDED BY NATURE FOR THE NUTRITION OF THE BODY IS THAT OF UNNATURAL STIMULI TO THE INTESTINAL TISSUES. No "Drug-Doctor" can invalidate the force of this proposition, or escape from its consequences. Neither will he dispute that drugs are legitimately comprised in this list—the *index expurgatorius* of the stomach. By this plain shewing, therefore, their tendency, as unnatural stimuli, *is* to augment the morbid predisposition of the intestinal tissues. This DRUG or NON-DRUG question is too important—the interests involved too supreme—to permit, on either side, any mere *ipse-dixits* in its discussion. Our limits are brief, but a page will perhaps suffice to shew up the philosophy of the whole matter.

Drug medication, *in any case of disease,* is only admissible, or defensible, on the ground of one of two principles. 1*st*, *That of Counter-irritation*, or *revulsion.* 2*d*, *That of a direct, specific, suppressive action on symptoms.* With regard to the former department of Therapeutics—Counter-irritation—it is a primary canon *never to operate directly on the surfaces or localities affected,* BUT ALWAYS AT A DISTANCE. This principle however is flagrantly violated in the drug-treatment of cholera, *which operates directly and especially on the morbid*

tissues—thus augmenting their irritation! What good could come of measures so insane—so flatly contradictory to sound scientific principles? But admitting that the professional object is not revulsion—since this fails to vindicate drug-practice in Cholera—what can be said for the only other principle on which drug-giving can be justified, *that of directly quelling the symptoms* (at whatever cost or risk to the organism). This symptomatic treatment is attempted by stimulants, opiates, antispasmodics, absorbents, astringents, and most unaccountably even by *cathartics* (in *un*homœopathic dose). Doubtless this farrago of means succeeds sometimes, where there is constitutional stamina to resist the effects both of the disease and of the poisoning. But as a general principle, to attempt to cope with the mere symptoms and complications of the malady—to dry up by such means the *streams*, while the *fountain-head* is neglected—is a mode of procedure worthy only of the infancy of science and of society. At the best, these means afford only a delusive, short-lived truce to the symptoms,—the discharges by-and-bye bursting their ill restrained flood-gates. "But," allege the partizans of drug-medication; "Do we not stop up simple diarrhœa, acute or chronic, by such means?" Granted. They *may* do so in such cases. Such patients can stand the medication. "Do we not arrest" the drug-apologists will further argue,—"Do we not arrest the diarrhœa of acute diseases, as Typhus, by such means?" Granted too. But what is gained? What is the usual result in the latter case? The end is *overdone*—the intestinal secretions are really *dried up* to the patient's infinite injury. The cutaneous secretions too are dried up; and if hœmorrhage from the nose do not prevent, coma supervenes. In this case, surely, nothing is gained for the patient—no credit for science,—no *heart*-ease for the physician, when he comes to lay his *head* on the pillow of reflection. So that the conclusion of *this* whole matter is, that drug treatment—take it on any principle, revulsion, or direct action,—is indefensible. Here the partizans of physic are fairly caught on the horns of a dilemma! Need we wonder, then, at the mortality of

Cholera? Patients, indeed, get well under the administration of drugs, but it is notwithstanding it, in spite of it—not in virtue of it. Irritating the delicate, irritable, intestinal membrane with these *false remedies*, is like exposing an inflamed eye to the glare of the sun, or keeping up active movement in a diseased joint.

Theoretically, then, drug medication is hazardous, injurious—and therefore to be excluded the list of remedial means. *Practically*, and in point of fact, the expectations from physic are fallacious, when the disease is fully formed,—when serous diarrhœa declares itself. Those who have seen most of the disease, and tried by turns every drug-expedient, have least confidence in any *medicinal* mode of treatment. Yet, spite of the general failure of drugs, the confidence therein of the public and of the professional masses (to judge from the assertions of nostrum-mongers) is as great as ever. This arises from ignorance in the one party, and prejudice in the other. The Cholera-patients are *known* to recover in far greater numbers under the Homœopathic than under the Allopathic physicians. The reason is obvious. In the one case, the malady is left to nature, or virtually so. The constitutional powers are not tampered with by poisonous drug-medication; and the patient obtains the sound regimen, the good nursing, and the proper home-comforts, his case requires.

It is now our business to develope the simple and effectual remedy we propose for Cholera in its various stages.

In its first stage, or for the premonitory symptoms. During the prevalence of Cholera, the first intimations of diarrhœa should be attended to. But it would be very unwise, often very pernicious, to check it at once by strong doses of astringent mixtures, which people in the panic of Cholera are very apt to do—going ever from one extreme to the other. In the event of undigested matters, or morbid excretions, having to make their way out of the body, the plan we propose possesses

the advantage, of offering no obstruction thereto, while it effectually quells the morbid action at its fountain-head. *The first thing to be done is to produce free perspiration.* Various simple means may be used for this purpose. The first and best is to put the legs and feet in hot water, mid-way up the thighs, if possible—at all events, to the knees—to be well rubbed while in it, and when they come out. A quarter of an hour of this process will suffice. The patient is then put to bed, and a large piece of flannel of several thicknesses is wrung out of nearly boiling water, and applied round the bowels from one kidney to the other; a capacious tin stomach-warmer, filled with hot water, is then put on the flannel. Now *pack* the patient up in blankets, *secundum artem*, and keep supplying him with small doses of cold water till he sweat. Let this go on for half an hour or so. Then unpack the patient, and wash him down for one or two minutes in the shallow bath at 70°. The patient is then put to bed, where he ought to keep quiet for a few days —living on a light farinaceous diet, gruel, broths; all to be taken cool. If the diarrhœa has been tolerably severe, it may be necessary to prolong the sweating to one hour; or if it threatens to return, then the fomentation, the hot tin, &c., to be repeated. The second plan to produce perspiration, is the hot-air bath. This may be effected in two ways, 1st., a brick is heated to nearly red-hot, and placed in a metal coal-scuttle by the side of a chair; on this chair the patient seats himself naked, but wrapped round from the neck with two or three blankets, whose extremities describe a circuit trailing on the ground. In this way no air gets under the blankets. The patient may hold on his knees an ewer of water to drop gradually on the hot brick, so as to produce a steam-bath. 2nd., The other way is to put 2oz. of spirits of wine in a small cup or vessel not exceeding an inch and a half in diameter,—this size, in order to prevent too large a flame. This is placed in a plate under a wooden-or straw-bottomed chair. Upon the seat a towel is folded to sit down on. The blankets are wrapped round the patient, as in the last case, and a lighted match is dropped into the spirit.

The patient remains in this hot-air process till the perspiration drops off him. The spirit-vessel, or the brick, is then removed, and he conveyed to bed with the warm blankets of his bath still around him; he is then covered up (packed) with additional blankets, and allowed to to perspire freely for half an hour, or an hour, according circumstances. During this process, the patient to drink small quantities of cold water from time to time. After this, the washing down in the shallow bath at 70°. for one or two minutes. The patient should then keep his bed for a few days, more or less, according to circumstances, severity of attack, constitution, &c.

Some would advise in the above case "hot brandy and water." Confirmed topers may have their favorite beverage, but the cold water drinkers will get through the disease best and soonest. Nevertheless, cases occur where artificial aid of some sort is necessary.

The question of the due-administration of stimulants, to sustain or rouse the vital energies, is one of the nicest, —the most difficult problem to solve in the whole range of practical medicine. It is quite manifest that the over-dosing of stimulants is mischievous in the extreme in other diseases of exhaustion, as well as in Cholera. It is equally clear, that the undue withholding of them will allow a patient irrecoverably to sink. Under circumstances of great exhaustion, a teaspoonful or tablespoonful of brandy, according to the condition, age, habits, or malady of the patient, may be cautiously given and repeated, or withheld, according to the effect. It is only for a case where the constitutional energies are so prostrated that they cannot be raised without it. Better is the lot of the patient who can dispense with it. But for safety-sake, and to give time, a tablespoonful in all twice or thrice repeated and diluted with hot-water, may be conceded at various periods of the malady before it has reached its height.

The above treatment is proposed with confidence for every form of diarrhœa. Its advantages will be that

the patient will avoid all the subsequent debility, malaise, and constitutional damage that attach to *cure* by drugs. The following further directions and cautions are to be observed:—

I. Once the skin has been brought into a warm moist condition by the means before mentioned, avoid keeping up an unnecessary and debilitating perspiration by heavy loads of bed-clothes.

II. All unnecessary getting out of bed, or exposure to cold, is to be avoided.

III. The room to be well-ventilated; all noxious smells that could infect it kept down by chloride of lime; and the utmost cleanliness observed.

IV. If the weather be cold or damp, the room to have a moderate fire, according to its size.

V. Perfect quiet to be maintained—cessation of mind-and body-labour—and a truce to cares and worry, if possible. Sleep to be conciliated.

VI. *Patients who have been long accustomed to stimulant liquors* may *then* have them; but in great moderation, and only in the event of their being urgently craved. This advice may shock teetotal prejudices. But if the bodily energies want in such a crisis any *flogging-up*, that exact moment is not assuredly the fittest in which to *commence* a temperance reform, or any sudden or sweeping change of dietetic habits.

VII. The appetite must on no account be indulged, either as to the quantity or quality of the viands of the convalescent.

Treatment of the second stage. Here the same paramount indications obtain as in the first stage, viz. I. To determine the discharge of fluids from the interior to the exterior skin. II. To restore the animal heat, *i. e.* to excite reaction. III. To support the con-

stitutional powers in the struggle. The means already devised are the fittest for these ends. This stage of the treatment, then, hardly requires any modification save that the prespiration may be more prolonged, but gradually diminishing the load of clothes to prevent its excess. In delicate or debilitated subjects, too, simple drying by means of a large sheet thrown round the person may take the place of the washing in the shallow bath. The amount of bed clothes and the temperature of the room should be so regulated as to keep up a gentle perspiration. Thirst should be freely indulged. If in spite of these efforts, the symptoms again make head, the patient must have the rubbing-wet-sheet adminstered. The sheet to be wrung out of water at 65°—thrown over head and shoulders, and very hard friction *over* the sheet, not *with* it, must be practised for at least five minutes. Then a dry sheet in like manner: last of all friction, with the dry blanket for a few minutes to get the heat up thoroughly. Now the patient is prepared to take the hip-bath. The water in it must be six inches deep, and of 65°. Herein he must be rubbed hard with the wetted hands for half an hour. The water must be gradually changed as it gets warm. At the same time the feet should be placed in a small tub of water not exceeding 3 inches in depth, and likewise at 65°. Hard friction of the feet and legs with the wetted hands must be applied by another attendant. On the finishing of these processes, dry the patient thoroughly in a large sheet. After this throw a dry blanket in like manner over him, and use the most active friction all over the person for five minutes. Then put to bed and administer an enema of water at 65°—a pint for an adult, gradually reducing the dose for young people and children. An ounce for every year in the descending scale is a safe rule. Thus a patient of 10 years old may have ten ounces of chilled water for an injection.

N.B. With *robust* patients, in all the foregoing cases of bath, &c. quite cold water may be used.

If, notwithstanding these means, active symptoms go

on unchecked, the rubbing-wet-sheet must be repeated. Then a dry sheet; and last of all, friction in the dry blanket for a few minutes. On getting into bed, repeat the enema, and place a compress (a folded towel) wrung out of water at 65°. on the abdomen, from loin to loin, and from pubis to stomach-pit. To cover and protect well this compress, several folds of a sheet must be placed under the patient, so as to envelope the lower half of the trunk. The ends of this are brought as a bandage over the bowels, and secured by pins. An additional blanket or two should be placed on the bed, and the patient well covered up. The water-doctor must now pause in his measures, and see what the efforts of nature will do. The patient is to be cautioned to avoid using any voluntary exertion, or even to get up in bed. Of water, if his instincts crave it, he cannot have too much. In strong patients, after half an hour, these processes may be repeated — the rubbing-wet sheet, the enema, the compress, the warm-packing-up in bed—or the sitz-bath of 60° for a quarter of an hour, may be substituted for the rubbing-wet-sheet, or taken after it. If, in spite of these measures, the severest symptoms of the second stage come on, the only alternative then is to pack the patient in the wet-sheet at once, and leave him to his fate. In nine cases in ten he will rally. Supply him copiously with water. Of course, the judgment of an experienced water-practitioner can alone *accurately* regulate all the details of treatment. But where such attendant is not to be had, the lay-practitioner will not go far wrong by adhering to the *general* directions.

Treatment of the *third stage*, or collapse. Hitherto this stage has been considered beyond the reach of medication. But it is not so. Art has effectual resources for it, yet almost untried. If untried, how can they be known to be effectual? By experience in conditions of the body essentially similar—in cases of suspended animation from violent injuries, from nervous shock, from cerebral compression or concussion, from drowning and hanging.

As a frozen limb is best restored by frictions with snow, so in the states where the vitality of the body generally is reduced to the lowest ebb, or suspended altogether, frictions with cold or chilled water offer the only chance of restoration: and this on the clearest grounds of Physiology. This principle was long ago demonstrated by the experiments of Dr. Milne Edwards. Here we have room neither to explain nor to vindicate it. We are content to state the fact. The practice in question consists in long friction in the shallow-bath. The best for this purpose is a wooden one of the shape of a *manger*, but twice the width, and a little higher at the sides and larger. This is half filled with water of 65°. Into this the patient is placed and rubbed by relays of attendants, four at a time, using active friction all over the body with wetted hands. As the water rises in temperature, part must be baled out, and replaced by cold water so as not to allow the heat to exceed 70°. This process should be kept up during many hours, so long as signs of vitality exist; or till the rallying functions of the organism shew that the crisis of death is passed. Good subsequent management will bring the patient perfectly through. This *desperate* remedy, as it may *seem*, (and it is only *seemingly* so,) would, if generally adopted in Cholera, save thousands from premature death. Its success would be equally great with persons hanged, drowned, or suffocated by the fumes of carbonic-acid-gas, or poisoned by prussic-acid, or otherwise. In fact, it is the only sound physiologic mode of treating persons in whom life is suddenly quenched, yet the organism is left in all its integrity. This is pre-eminently the case in Cholera. The thousands who rally from this last dread extremity of nature—even after being half-poisoned with drugs—prove the resources of nature, while they caution us not needlessly to waste those resources by violent medication, given without knowledge, without aim, and not only useless, but mischievous.

Treatment of the consecutive fever. This is an artificial morbid state—the product of the incendiary

drug-treatment of the previous stages of the malady. Cholera treated by the plan we propose, (and which is, in essence and spirit, that which Priessnitz and others have adopted with uniform success in a great many cases of the epidemic) will not be followed by this consecutive fever. As it presents after drug-medication, the most effective queller is a succession of wet sheet packings at intervals of 15, 30 and 40 minutes, according to its violence, or the strength of the patient, then to conclude with a washing-down in the shallow-bath for two minutes. Cold water injections once or twice repeated, during the height of the reaction—plenty of cold water to drink—and no food for the time the febrile movement remains. In the consecutive treatment of the convalescent, the stomach must have as little to do as possible, till the gradual restoration of the overwhelmed digestive functions renders food necessary and safe. *Till such a time arrives*, a wine-glass of milk, or gruel, or beef tea, or broth, given every 3 hours will amply suffice for sustenance.

THEORY OF CHOLERA.

THE TRUE FUNCTION OF THE IRON OF THE BLOOD.

"The blood is the life." Such is alike the dictum of Scripture, and the discovery of science. The blood-corpuscles are probably the peculiar, if not the exclusive, seats, centres, and sources of vitality. They are at all events intimately and essentially connected with vital functions. The singularity of the composition of the blood-globule is, that it contains IRON in its delicate investing-membrane. This is the chief element of the colouring matter of the blood. It is to be observed that iron *out of the circulation* is found in no structure, tissue, or organ of the body! This indicates a peculiarity of function, a specific office, which must now be inquired into.

Professor Liebig has hit upon *one-half* of the truth.

He contends that the blood-corpuscles, in virtue of the iron they contain, serve as the carriers of oxygen from the lungs to all parts of the body. In the arterial blood the iron exists in the state of peroxyde—its highest degree of oxydation. In the capillaries a portion of the oxygen is abstracted to subserve the molecular changes wherein vital operations consist. The iron is reduced to the state of a protoxyde, beyond which it cannot go. The *debris* of the transformed tissues produces carbonic acid, which saturates the protoxyde of iron, and produces the proto-carbonate. In the lungs an interchange of gases takes place through its thin wet porous membrane. Carbonic acid is given off for the oxygen of the air.

This is Liebig's beautiful and highly-probable theory of the use of the iron of the blood-corpuscles. But *we* believe this to be only *one-half* of the truth. The other half we shall now endeavour to set forth.

All *space*—the illimitable expanse of the Universe—and all bodies, inorganic as well as organic—are pervaded and permeated by a subtle magnetic ether, or electric element. This subtle matter, when luminous, is seen in the lightning. It mingles with the chemical constituents of the atmosphere. For all that is known of this magnetic or electric principle, it may be the *substratum* of the ultimate atoms of matter—the *basis* of the chemical elements, oxygen, hydrogen, carbon, nitrogen. It may be truly called the SPIRIT of the air. In the Mosaic account of creation, and in the book of Job, it is designated as "God's Spirit,"—and is recognised as quite diverse from "Breath" or atmospheric air.

One half of the function of respiration, we contend, is not merely to give off the carbonic acid of the blood, and to introduce in its place the oxygen of the air, but also TO GIVE ENTRANCE CONTINUALLY TO FRESH SUPPLIES OF THIS ELECTRO-MAGENTIC PRINCIPLE, AS A VITAL STIMULUS CO-ESSENTIAL WITH THAT OF THE OXYGEN OF THE AIR, FOR THE HEALTHY PERFORMANCE OF THE VITAL FUNCTIONS. IRON, by reason of its affinities for electricity, and its high conducting powers, is pre-eminently fitted for this function; and that its utility *is limited to the*

rounds of the circulation—that it is no where else required,—is proved by its being no where else found. If Iron constituted a part of the solid fabrics of the body, chemical analysis would detect it, as it reveals the other elements of the tissues which first exist in the general circulating fluid. The true office, then, of the iron of the blood, it is highly probable, is that of a simple *vehicle*—a conductor of OXYGEN and ELECTRICITY which are the prime stimuli of vital movements—equivalent to that BREATH and SPIRIT with which the Almighty first animated breathing-frames; and which keeps them alive so long as the due relations obtain between that wondrous mechanism, and those sustaining elements. When these fail, and "dust returns to the dust," God is said to *recall* his "Breath" and "Spirit."

It is observed that in those diseased states wherein the colouring-matter (the iron) of the blood is deficient (that is the means of introducing oxygen and electricity into the system,) the functions of life are languidly performed. This is seen pre-eminently in Chlorosis (green-sickness), anœmia (bloodlessness) &c. In these diseased states, health is restored by adminstering the salts of iron; i.e., by imparting the agent that attracts and introduces the oxygen and electricity.

It is a well established fact, that the electrical principle is deficient in the atmosphere, or in the underground currents, in those localities where epidemic cholera prevails, and that it is most deficient where the latter is most malignant. A parallel fact is equally well established,—viz., that in the localities in question, there is an almost universal tendency in the population to a languid performance of the vital functions—especially an unusual oppression and malaise about the stomach and bowels. In such a state of matters, it wants but a slight exciting cause, an indigestion, a debauch, cold, trouble, physic, to upset the nice balance of health, and to determine the prevalent disease. Where the epidemic reigns, a combination of its favouring causes

obtains, viz., 1st, the defect of a vital stimulus in the atmosphere. 2d, The vitiation of the atmospheric gases by those exhalations and impurities inseperable from crowded masses of human beings, and the violation of sanitary laws. 3d, The debilitation of the body by fatigue, by excesses, by want, by anxiety and apprehension. 4th. Failure of corporeal transpiration.

As the source of all vitality is in the blood; so in altered or vitiated states of this fluid are to be sought the elements of all diseases, either as cause or consequence. Science is every day leading us back to the old Humoral Pathology. The primary result on the blood of the defect or vitiation of its vital stimuli *is to weaken the normal vital affinities obtaining between the constituents of the blood.* This is the FIRST LINK in the chain of morbid causation. The result of this pathological lesion is to bring the blood's constituents more or less under the dominion of mere chemical or physical laws. HENCE THE TENDENCY OF THE SERUM TO SEPARATE FROM THE FIBRINE (CLOT) IN CHOLERA.

It wants, then, in this condition of the circulating fluids but a slight irritation in the already predisposed exhalant tissue of the bowels, to commence the drain of this serum through the patulous capillaries of the intestine. This process started—the determination of the serous fluids to this vast, facile, and patent outlet, once thoroughly established,—what is to stop the life-ebbing current? It is clear that its innate tendency is to augment, rather than diminish—and this by reason of the neutral salts of that current every moment intensifying the irritation of its channels—acting in short as a cathartic mixture.

The SECOND LINK in the chain of morbid causation in Cholera—perhaps, in all epidemics—*is lesion of the Organic or Ganglionic Nervous centres.* However the explanation of the fact may be, it is undoubted, that the stomach, in the cases in question, is the first to give intimation of disordered action; then the heart by languid, excited, or irregular circulation; then the

brain by defective volition, and mental and corporeal inertia—all this through interference with the nutritive energies of the economy, or those molecular, chemico-vital changes controlled by the organic nervous apparatus. Hence THE CAPILLARY SYSTEM OF VESSELS wherein those vital operations take place, and which is directly and especially under the control of the organic nerves, —is the next part implicated. This constitutes the THIRD LINK in the chain of morbid actions. It is highly probable, if not certain, that the same law holds with regard to the nerves of ORGANIC LIFE, as with those of ANIMAL LIFE,—VIZ., *that an irritation at their extremities is propagated to their centres, and vice versa*—that, for example, a noxious element introduced into the blood, (as strychnine) or the defect of a vital stimulus in the circulation, (as a want of oxygen, electricity, or the proper plastic elements of the blood) is immediately taken cognizance of by the organic nerves distributed on the blood-vessels, and *reported* to the organic nervous centres—i.e., morbidly influences them, *lowers vital action in the very vital centres.* In the same way, the *due quality* of the vital stimuli, or of the plastic elements of the blood, by the very same route, communicates an impulsive vital energy at head-quarters—making the thrill of health to vibrate to the remotest extremities of the organism. The ANIMAL NERVOUS SYSTEM is intimately, inseparably associated with the ORGANIC NERVOUS SYSTEM, and simultaneously gives notice of assault or derangement—as it is equally quick to *indicate* an augmented weal to the economy. *The result of the conjoint lowered action of these two nervous systems, and of the capillary system so much under their dominion—is to induce a morbid irritability of the organism, local or general, rendering it liable to be disordered by slight causes at other times inoperative.* This is the *under-par* condition of the living organism, by whatever causes induced, that predisposes it to be acted upon by epidemic influences.

An epidemic disease is a non-contagious disease by its very nature. It arises from one universal morbid agency to which all are alike exposed in the localities

where it obtains. It does not spread by the contact of individuals, but breaks out simultaneously in independent localities. The severer grades of such diseases are confined to dense populations, because these present a concentration of all the common exciting causes. In such cases sympathy and panic complete the measure of the mischief. That whole families, or people in the same "block" of buildings, are attacked, is no proof of contagion. These are all subjected to the same atmospheric cause which, conjoined with an existing predisposition, (lowered vital powers) disposes the system to be acted on by slight exciting causes—fatigue, fear, grief, privations, despair of remedy, irregular meals, and the noxious *drams* usually had recourse to, to keep off infection, as the populace believe. Those who go most among Cholera, as physicians, nurses, undertakers, &c., are no more disposed to be attacked than those who entirely avoid exposure. Dissection wounds never communicate the the disease.

Why the disturbing influence of Epidemics is thrown upon one particular tissue more than another;—why the mucous membrane of the lungs is now the seat of the predisposition;—that of the bowels at another time;—why the villi of the small intestines is here effected, and there the mucous membrane of the colon; why in one place the Plague, why in another Typhus-fever rages—are among the *arcana* on which science has shed no light. It may be that these particular local predispositions—the epidemic influence being one and identical everywhere—are determined by dietetic influences, which we cannot at present appreciate. That pestilence usually stalks in the course of famine, would seem to indicate an origin in common causes.

Endemic diseases spring from the operation of confined local causes, as malaria for example, or the exhalations arising in crowded and filthy localities, as in jails, workhouses, ships, barracks, camps, the wretched cellars and hovels of the poor in large towns. *These are contagions;* i.e., the emanations from the sick will

infect those who are sound, independent of exposure to the original causes. Contagious diseases have some determined period at which they attack after exposure. They rarely attack the same individual the second time. Cholera would, on the slightest application of the exciting causes.

PREVENTION.

GENERAL SANITARY COUNSELS.

Every person ought to know that, with proper precautions and self-management, he may escape the epidemic—at least its dangerous stage. The confidence and hope inspired by this idea, if generally entertained, would mitigate the entire horrors of the visitation. For the masses of the poor, who cannot carry it out for themselves, a system of domiciliary visitation, both to relieve their wants, and to combat the disease in its first stage, will do all that their case permits—all that humanity to our neighbour dictates, and duty to ourself demands. In cases where the misery, or over-crowding of the population is so excessive as to neutralize all other measures, the only remedy consists in change of habitation for them—at least a temporary transference to cleanly and spacious accommodations. This may be done in tents in the fields, in fine weather; and at all times, by converting public buildings,—even churches —into temporary places of refuge. This surely would be no desecration in an exigency. It is not considered so for the victims of war! What is the objection to it for the victims of Pestilence? Is Humanity a thing separate from Religion? More Money than would answer these ends has been spent in Cholera-Hospitals, which are at once a useless drain upon the public purse, and a perfectly-illusive guarantee for the objects intended. In the stages in which Cholera patients are

taken to hospitals, not a moment is to be delayed. The precious time for action—the nick of time to quell the disease, is lost. The moment the practitioner comes in contact with the disease, it must be combated then and there, and with what weapons the circumstances of the case or previous local arrangements admit. The apparatus necessary for the simple and effective plan of treatment we propose, may, by a system of good medical police, be within five minutes application in any locality. Without strict medical surveillance and "means and applicances to boot," there is no successful dealing with the disease among the masses of the poor and destitute. Quarantines and *cordons militaires*, according to our previous shewing of the real nature of the disease, are no safe-guards at all.

Individuals during the cholera-panic should attend to the following matters of personal hygiene, as best affording immunity from attacks.

I. Be scrupulously clean in person, house and habits. Let *chloride of lime* be freely used to extinguish all foul odours from every controllable quarter in and out of doors.

II. A cold, chilled, or shower-bath should be used by every person, on getting out of bed in the morning. Once or twice a week, besides, the whole body should be throughly washed with tepid water and soap, *before* taking the morning bath. Friction with *soft* flesh brushes, or *proper* hair-gloves, (goats'-hair) morning and evening, tends to keep up an activity of the cutaneous circulation, highly conducive to the health, especially of persons of sedentary habits or occupations.

III. Dietetic errors are perhaps the source of three-fourths of the ills that afflict society. They alter mind, they alter disposition, they alter temper, they alter character, they alter the passions, *they alter the organism*, (and all for the worse,) which last alteration, gives an inveteracy and a permanency to all the other

alterations,—and all this, not only in those flagrantly- and habitually-guilty of gluttony and drunkenness, but in persons who boast of their "moderation in all things." These broad allegations could be substantiated (if time and space permitted here,) by an appeal to the every-day habits of all classes of society, and to the facts of physiological science, which shew what is most conformable to the laws of man's organization, and how far short of the mark civilized man comes, *or rather how far beyond it he goes.* Suffice it for the practical purposes of this Dissertation to observe, that any thing tending to produce indigestion should be avoided with extra care during the period in question. To this end, the *quantity* and *quality* of the diet require the *first* consideration, and *regularity of meal-hours*, the *second;* thorough chewing and slow-eating, the *third.* Animal food should not be eaten more than once a day, and then well cooked. But most people eat *one half* more animal food than their system requires, or their exercise will justify. We unhesitatingly declare our conclusion, from a review of the structure of man's digestive organs, as well as from physiological, pathological, and even moral considerations, that in his diet the *farinaceous* element should much predominant over the *animal* element. The nutritive principles—the *albumen, fibrine, and caseine*—do not differ in the two kingdoms of nature that yield them. In the animal, they are more easily got at by some stomachs, and contain besides a *stimulating principle* (the osmazome or something else) which constitutes *flesh* among food, what *brandy* is among drinks. Hence the difficulty to get weaned from this diet when long accustomed to it; and the sinking and exhaustion complained of during the period of weaning from it. This caution we give, however, *not to make any sudden or violent dietetic changes during a Cholera-visitation.* To the extent that any article is *positively* noxious, to that extent it should be given up on the instant. To the extent that it is only *relatively* injurious, to that extent it should be withdrawn gradually, so that the system may not suffer by a sudden transition to things to which it is unaccustomed. It is a singular fact in

regard to Cholera, *that the feeders on vegetable diet*, (fruits, roots, and farinaceæ), *have been exempt from the disease!* This opens up matter of physiological speculation to fill volumes, and points to very weighty practical conclusions.

It is impossible here to give dietetic directions to comprise every case and constitution. Each person's discretion and experience must be his best guide in the absence of his physician. These, however, are not to be much trusted, if surer data can be had. It is a saying of old date, "experientia fallax"; and those renowned for discretion do often very indiscrete things. Let the valetudinarian, the irritable, the anxious, the hard-working, and hard-thinking portion of the community remember, that it is not the amount of food *eaten*, but of that *digested*, that nourishes,—and that what is more than can be digested, or what exceeds the wants of the economy, tends to disease in many ways. 1st, By overwhelming the stomach. 2nd, By irritating the bowels,—the undigested remnants of a meal acting as a foreign substance. 3rd, By *repleting* the circulation. 4th, By deranging secretion. 5th, By impeding the vital changes in the capillaries. 6th, By unnecessarily exhausting nervous power, both organic and animal. 7th, The result of all this is the production of congestion in the tissues of the organs most over-worked—the robbing of the *surface* of the body of the amount of blood that the *interior* has in excess, and the disturbance thereby of that equilibrium of the functions which constitutes health.

An injurious restriction has been laid upon vegetables by "Cholera-doctors." Provided they be of good quality, well-cooked, and eaten in moderation, nothing is more wholesome. It is only man's false artificial arrangements that make the bounty of the Creator to be impugned, in giving us "the liberal fruits of the earth."

Three meals a day taken at properly-divided inter-

vals, say at 8, 2, and 7, will ensure, perhaps, higher health and capacity for exertion than any other arrangement. With regard to the former and latter of these meals, good stale household-bread, butter, an egg, cocoa or black tea moderately strong, with a good allowance of new milk, will answer for any sort of constitution, and any amount of work. For dinner, *cold* beef or mutton in preference to *hot*, and not exceeding half a pound for any person, with vegetables and bread *quantum suff.* To conclude with a *good* pudding of any sort for the robust. The valetudinarian, or the brain-worked, should only partake of rice or sago-pudding, stiff and nearly cold, if not quite—if made the previous day all the better. *New*, *soft*, *sloppy* rice and sago puddings are more indigestible than when stale and consistent like cheese. Heat them slightly if necessary before eating. But the healthy palate and stomach will prefer them cold.

Drink.—"*αριστον μεν ὑδωρ.*" Water is best. But for the effects of strong drinks on the human constitution, the epidemic would be divested of half its virulence. We can, therefore, lend no more sanction to these liquors as *popular preventives*, than we do to them as *curatives*. In every sense, and time, and place, they are *bad*, unmitigatedly *bad*. If *bad* should be exceptionally good for the toper, how miserable his condition!

IV.—Clothing. The weather, the occupation, and the constitution should regulate this. Comfortable warmth of surface, and no more, is the object intended. Flannel is not an advisable article of wear next the skin. Linen or calico is more genial to that sensitive surface—the flannel above this. The error of society is over-clothing, over-coddling, over-comforting, over-firing, over-closeting, over-bedding, over-screening from the weather, by all sorts of expedients. Those who wear few clothes, who take exercise in the fresh air moderately, who live temperately, who drink cold water freely, who bathe in cold water daily, and sleep

with their bed-room windows open, get hardened against all *intemperies* of weather, and enjoy an immunity from catarrhs, spasms, inflammations and fevers.

V.—Fatiguing labours, worrying cares, corroding passions, and exhausting pleasures, are equally pernicious.

VI.—Calmness and self-possession of mind—trust in Divine Providence, and the Power, Solaces, and Hopes of Religion—are great safeguards against epidemic influences. *Fear hath torment*, and powerfully deranges the health. Cholera often attacks in the *night*,—the dread season to many of excited fancy and vivid alarms.

VII.—*Eschew all drugs, all Cholera-nostrums and "preventives."* A simple aperient-draught has often induced, in the otherwise healthy, a fatal attack of the disease. "Opiates" and "stimulants" are quite as pernicious in their way. But we need not here retrace old ground.

"FINIS CORONAT OPUS."

I have discharged my duty as a physician, as a lover of my country, and as a well-wisher of my species in general;—amply rewarded, if perchance my mite of learning or experience be received as an humble contribution called for by the urgency of the times, and fitted to soothe suffering or to save life.

APPENDIX.

We make no excuse for here introducing a quotation from a public print :

Cleanliness a Preventive of Cholera.—In the midst of the pestilential districts of South London, stand a number of important public institutions, which, up to the present time, have wholly escaped the visitation of cholera. Bethlehem Hospital, with its 2,000 insane inhabitants; the Infant Orphan Asylum, crowded with susceptible inmates; the Philanthropic Institution, in which 500 sons and daughters of convicts recover the lost comforts of home; the Asylum for the Blind, a dwelling place for the sightless poor of the metropolis; the Magdalen, a refuge of the betrayed and abandoned victims of licentious life; the Queen's Bench Prison, crowded with the dissolute, the desperate, the broken-hearted—all within a circle of half a mile in diameter; and, taking them in a cluster, we have on the west the desolated regions of Lambeth; on the east, the plague-spotted localities of Southwark; on the north, the typhoid districts of St. George's Fields; and on the south, the undrained, ill-built, close-packed streets of the poor inhabitants of Kennington; forming together a broad belt of houses in which the cholera has raged with fearful constancy and power. Yet in no one instance has it appeared within these sanctuaries of health. Why should the distance of a few yards produce so important a difference between the debtor within the prison walls and the creditor beyond them? The answer is at hand---the reason is obvious. These institutions are kept in a state of perfect cleanliness, dry, of a moderate temperature, in every respect well ventilated, and altogether in so admirable a sanatory condition that were the outside population removed within their favoured precincts to-morrow, there is no doubt it would immediately find itself under the protection of the same healthful influences which, while the wise, the humane, the industrious of the land are perishing, preserves the madman, the orphan, and the outcast. No lesson of health can be stronger. Let the Boards of Guardians look to it. Parochial expenditure cannot be avoided during a season of public calamity like the present. Money must be spent, either in saving life or in the maintenance of pauperism, widowhood, or orphanage. In this case, economy is on the side of humanity, and the most expensive of all things is to do nothing.---Historic Times.

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